Patent Claims:

1. Use of haematopoietic growth factors, in particular erythropoietin (EPO) or thrombopoietin (TPO), or derivatives, analogues or parts thereof for the preparation of a medicament for promoting structural tissue regeneration.

2. Use according to Claim 2, characterized in that the tissue has previously been traumatized.

3. Use according to Claim 1 or 2, characterized by the use of the receptor-binding domain of the growth factors or derivatives or analogues thereof.

4. Use according to Claim 1 or 2, characterized in that a mimetic peptide of one of the growth factors, in particular EMP or DMP, is used.

5. Use according to one of Claims 1 to 4, characterized in that the growth factors or derivatives, analogues or parts thereof have additional glycosylation sites compared with the native growth factor.

6. Use according to one of Claims 1 to 5, characterized in that the growth factors or derivatives, analogues or parts thereof are conjugated with PEG.

7. Use according to Claim 1 or 2, characterized by the use of *novel erythropoiesis stimulating protein* (NESP).

8. Use of an EPO-inducing factor for the preparation of a medicament for promoting structural tissue regeneration.

9. Use according to one of Claims 1 to 8, characterized in that one of the following factors is additionally employed: somatostatin, leukemia inhibitory factor (LIF), "ciliary neurotropic factor" (CNTF),

"transforming growth factor beta" (TGF beta), prostaglandins, granulocyte-macrophage-stimulating factor (GM-CSF), granulocyte-stimulating factor (G-CSF), growth hormone releasing hormone (GHRH), thyrotropin-releasing hormone (TRH), gonadotropin-releasing hormone (GnRH), corticotropin-releasing hormone (CRH), dopamine, antidiuretic hormone (ADH), oxytocin, prolactin, adrenocorticotropin, beta-celltropin, lutrotropin, vasopressin, nerve regeneration factors, preferably nerve growth factor (NGF), vascular regeneration factors, preferably vascular endothelial growth factor (VEGF) or plateled derived growth factor (PDGF).

10. Use according to one of Claims 1 to 9, characterized in that endothelial cells are present.

11. Use according to one of Claims 1 to 10, characterized in that the regeneration of the tissue is controlled locally.

12. Use according to one of Claims 1 to 10, characterized in that the medicament comprising one or more of the factors according to one of Claims 1 to 9 is administered topically.

13. Use according to one of Claims 1 to 10, characterized in that the medicament comprising one or more of the factors according to one of Claims 1 to 9 is administered systemically.

14. Use according to one of Claims 1 to 13, characterized in that the growth process is supported by a support structure.

15. Use according to Claim 13, characterized in that the support structure is treated with one of the factors according to one of Claims 1 to 9.

16. Use according to Claim 14 or 15, characterized in that the support structure used is an implant, a transplant or a support material for the growth of cells.

17. Use according to one of Claims 14 to 16, characterized in that the support structure has been pre-colonized with cells, preferably tis-

sue-specific cells, precursor cells, bone marrow cells, peripheral blood, fatty tissue or fibrous tissue, or prepared for *in vivo* colonization or *in vitro* inductive remodelling.

18. Use according to Claim 17, characterized in that the cells employed are adult progenitor cells, tissue-specific cells, preferably osteoblasts, fibroblasts, hepatocytes or smooth muscle cells.

19. Use according to one of Claims 1 to 18, characterized in that the cell aggregates forming during the regeneration process are encapsulated and optionally frozen.

20. Use according to one of Claims 1 to 19, characterized by the regeneration of nerve, muscle, epithelial or connective tissue and organs and structures derived therefrom.

21. Use according to one of Claims 1 to 20 for the regeneration of the liver, in particular in liver cirrhosis, hepatitis, acute or chronic liver failure.

22. Use according to one of Claims 1 to 20, characterized by the treatment for the regeneration of bone, cartilage, and tissue of endocrine organs, the cardiac muscle, of heart valves, venous valves, arterial valves, skin, vessels, aortas, tendons, cornea, trachea, nerves, meniscus, discus intervertebralis, intestinal epithelium, ureters, urethra or the bladder, and for the treatment of degenerative diseases or for supporting tissue regeneration in chronic inflammation, such as, for example, in Crohn's disease, colitis ulcerosa of diabetic ulcers, gingiva or for the stimulation of neovascularization after a tissue injury.

23. Support structure comprising at least one haematopoietic growth factor or derivatives, analogues or parts thereof according to one of Claims 1 to 7 or an EPO-inducing factor according to Claim 8.

24. Support structure according to Claim 23 additionally comprising at least one of the following growth factors: somatostatin, leukemia inhibitory factor (LIF), "ciliary neurotropic factor" (CNTF), "transforming growth factor beta" (TGF beta), prostaglandins, granulocyte-macro-

phage-stimulating factor (GM-CSF), granulocyte-stimulating factor (G-CSF), growth hormone releasing hormone (GHRH), thyrotropin-releasing hormone (TRH), gonadotropin-releasing hormone (GnRH), corticotropin-releasing hormone (CRH), dopamine, antidiuretic hormone (ADH), oxytocin, prolactin, adrenocorticotropin, beta-celltropin, lutrotropin, vasopressin, nerve regeneration factors, preferably nerve growth factor (NGF), vascular regeneration factors, preferably vascular endothelial growth factor (VEGF) or plateled derived growth factor (PDGF).

25. Support structure according to Claim 23 or 24, characterized in that the support structure is an implant, a transplant or graft, a support material for the growth of cells, a stent, a patch, a catheter, skin, a hydrogel, a bone replacement material, an allogeneic, autologous or xenogenous, acellularized or non-acellularized tissue, a synthetic tissue, a feeder layer or a fleece.

26. Support structure according to one of Claims 23 to 25, characterized in that the support structure is pre-colonized with cells, preferably tissue-specific cells, precursor cells, bone marrow cells, peripheral blood, fatty tissue or fibrous tissue.

27. Support structure according to one of Claims 23 to 25, characterized in that the growth factors or derivatives, analogues or parts thereof according to one of Claims 1 to 9 are embedded in a biodegradable polymer layer.

28. Process for the preparation of a support structure for cell regeneration, characterized in that the support structure is coated with at least one of the growth factors, derivatives, analogues or parts thereof according to one of Claims 1 to 9.

29. Process according to Claim 28, characterized by activation of the support structure, preferably by plasma ionization or laser irradiation.

30. Process according to at least one of Claims 28 and 29, characterized in that the support structure is pre-colonized *in vitro* with cells,

preferably tissue-specific cells, precursor cells, bone marrow cells, peripheral blood, fatty tissue or fibrous tissue.

31. Use according to one of Claims 1 to 22, characterized in that at least some of the process steps for promoting tissue regeneration are carried out entirely or partly *in vitro*.

32. Use according to Claim 31, characterized in that the growth process is supported by the administration of stem cells from the bone marrow, blood, tissue, fatty tissue, umbilical cord tissue or blood.

33. Use according to Claim 32, characterized in that the stem cells are pre-treated *in vitro* with a haematopoietic growth factor, in particular erythropoietin (EPO) or thrombopoietin (TPO), or derivatives, analogues or parts thereof.

34. Pharmaceutical composition comprising cells which have previously been pre-treated *in vitro* with a haematopoietic growth factor, in particular erythropoietin (EPO) or thrombopoietin (TPO), or derivatives, analogues or parts thereof.

35. Pharmaceutical composition according to Claim 34, characterized by stem cells pre-treated *in vitro*.

36. Use of a pharmaceutical composition according to Claim 34 or 35 for wound healing and liver regeneration.